(NAVMC—QUANTICO)

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10.77A-51-35

TEST REPORT
OF
MARINE CORPS EQUIPMENT BOARD

PROJECT NO. 447

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DATE 22 Sept By [illegible]

ENGINEER ARMORED VEHICLE

19 Oct 45
Turn
FILE COPY
to Lt Hoffmann

MARINE BARRACKS
QUANTICO, VIRGINIA

~~CONFIDENTIAL~~ **Date** 15 SEP 1945

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10.77A-51-35

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MARINE BARRACKS

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A-P-P-E-N-D-I-X

(A) Conf ltr Pres MCEB to ChExpSec, File No. 10.77A-3-lw, dtd 14Jun45.

(B) Secret ltr CMC to Pres MCEB, Serial No. 004C8345, dtd 24Mar45.

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IN REPLYING
REFER TO NO.

10.77A-51-35

MARINE CORPS EQUIPMENT BOARD
MARINE BARRACKS, QUANTICO, VA.

Experimental Section

PROJECT #447

SUBJECT: ENGINEER ARMORED VEHICLE

REFERENCES: (a) Conf ltr Pres MCEB to ChExpSec, File No. 10.77A-3-lw, dtd 14Jun45.
(b) Secret ltr CMC to Pres MCEB, Serial No. 00408345, dtd 24Mar45.

ENCLOSURES: (A) Motion picture of firing tests (furnished with original of report only).

PURPOSE:

1. In accordance with the basic correspondence of reference (b), it is the purpose of this project to determine

a. Accuracy, efficiency, durability, and rate of fire of the modified T-76 rocket launcher.

b. Efficiency and ease of operation of the Tank Dozer Blade when used on the Engineer Armored Vehicle.

c. Adequacy of periscopes and the 360° vision cupola for efficient operation of the Engineer Armored Vehicle.

d. Range and efficiency of the 50-gallon Sponson-type tank flame thrower as adapted to the Engineer Armored Vehicle.

e. Inner compartment storage capacity for rockets and explosives.

f. Efficiency of the "Doozit" attachment in placement and firing of charges against obstacles.

g. Efficiency and speed with which Engineer demolition crews can enter and leave this vehicle through the side port.

2. To effect these tests, typical concrete structures including a casemate, a pillbox and a reinforced wall were constructed in the Marine Corps Schools Area E-6. Drawings of these are shown as Figure #6.

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3. The scope of the investigation included all of the required tests with the exception of the test of the 50-gallon Sponson-type tank flame thrower. This was not available, and flame thrower tests were limited to those involving the periscope-type of flame thrower, M3-E6R3.

ENGINEER ARMORED VEHICLE
FORWARD STARBOARD CORNER

MARINE CORPS
EQUIPMENT BOARD
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ENGINEER ARMORED VEHICLE
AFTER PORT CORNER

MARINE CORPS BOARD
EQUIPMENT
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FOREWORD:

1. The Engineer Armored Vehicle (referred to for brevity in this report as EAV) was delivered by Heintz Manufacturing Company to a representative of the Marine Corps Equipment Board at Philadelphia on 5 June 1945. It was moved overland by tank transport to Quantico, Virginia and, on 6 June, was delivered to the Ordnance Repair Depot, Marine Corps Schools, Quantico, Virginia.

2. The dozer blade was shipped separately from the manufacturer, Laplante Choate Manufacturing Company, Inc., Cedar Rapids, Iowa, and was received approximately 3 June 1945. In accordance with arrangements made with the Ordnance Repair Depot, the dozer blade was there installed and a representative of the manufacturer was assigned to aid in the installation. The Ordnance Repair Depot accomplished the installation of the dozer blade and the EAV was returned to the Marine Corps Equipment Board on the morning of 7 June 1945.

3. Because of the problem attendant the damaging of roads by the steel treads, the tank was sent to the test area and all subsequent work of installation of the various accessories was performed in the field.

4. The basic directive (ref. b) did not specifically request tests of the installed radio sets, the T-73 launcher, the armored trailer or the M3 Demolition Snake. As all these may be considered accessories to the EAV they have been discussed and tested and the data and facts regarding their performance have been accumulated.

5. Two radio sets were installed, a SCR-508 and an AN-VRC-3, by personnel sent from the Chester Tank Depot. The radio-inter-phone set, the SCR-508, was difficult to install and required two full working days for its accomplishment. The task is not considered serious as the installation would normally be accomplished at the manufacturer's plant before the tank is shipped.

6. When received from the builder, the EAV mounted a 7.2" multiple rocket launcher, T-73. This launcher is mounted above the turret, is trained with the turret and is controlled

in elevation by an electric motor and elevation gear.

7. Previous to the start of the tests of the EAV, six days' training was given the crew for familiarization with the vehicle and its accessories and for the checking of gear and equipment. The practice afforded the crew in the handling of the EAV, in driving and maneuvering the vehicle itself while brief, was considered sufficient for the purposes of these tests.

8. Some time was spent in mechanical adjustments of the EAV and its power plant. This work and the correction of subsequent malfunctions which occurred during the practice runs and the tests were not considered as part of the test, as the vehicle except where modified, is standard. At the start of the tests the vehicle was considered as in top mechanical condition though new and stiff. A greater period of breaking in would have softened the controls and improved the driver's skill. Inasmuch as firing is done from a fixed position, the driver's skill had little, if any, effect upon the performance of the rocket launchers and would affect only the effectiveness of the dozer blade in this installation.

9. The demolition crew of three men was trained to their tasks in the training period of the crew as a whole. Practice in dismounting and mounting via the sponson doors was afforded, as this was a procedure new to demolition work.

10. Radio communication drill and practice in the handling of calls in accordance with the correct procedure was given the crew during all phases of the preliminary training and also during the tests.

11.- Upon receipt of the M-8 Armored Trailer, tests were conducted to determine the stowage capacity of both trailer and the EAV. To facilitate stowage, a divided partition was welded across the center of the trailer athwartship, dividing the trailer body into two compartments. In one of these compartments a rack was installed for the stowage of 21 nested unassembled rockets. Comments on this stowage problem will be found in the body of the report.

12. Studies and practice for inboard stowage on the EAV were made to expedite the handling of ammunition and the loading of the T-76 launcher. Stowage of the demolition charges was also worked out. This critical problem will be discussed at greater length in the body of the report.

13. A "Poozit" was built of wood in accordance with the specifications which stated that the device can be built of material available in the field. Lumber available on the post was used in this case with the resulting poor performance and a failure of the device to support the required load. No further attempts were made to substitute the prescribed metal frame.

14. During the week of crew training, ample time was afforded the assistant driver for practice in manipulation of the dozer blade and handling of the tank when used as a bulldozer. Due to previous experience, the operator was amply proficient at the end of eight hours practice.

CONCLUSIONS:

1. During all tests the Engineer Armored Vehicle was considered integrally with its accessories, although the conclusions here drawn emphasize the accessories and their adaptability to their designed purpose.

2. With exceptions to be discussed below, the vehicle meets the requirements for which it was designed. In frontal assault of strong emplacements it is capable of placing demolitions expeditiously by projection from a rocket launcher, by hand placed demolition packs or by hand thrown demolition charges.

3. The conclusions reached on the accessories are:

a. T-76 Launcher.

(1) The weapon is effective and accurate at a range of 100 feet. At 300 feet, the projectiles are effective but accuracy, while fair, falls off.

(2) Modifications are desirable in the breech mechanism and loading arrangements. The electrical firing system can be improved to prevent malfunctions due to moisture and to insulation failures. A stand-by circuit with independent leads is desirable in the event of failure of the main circuits.

(3) The elevating mechanism and indicating devices are adequate.

b. Dozer Blade.

(1) The Dozer Blade was effective in normal terrain. As the vehicle will probably encounter abnormal dozer operations, it is desirable that the hydraulic blade control be increased in capacity. The blade cannot now be raised when a large earth mass is being moved.

c. Periscopes.

(1) The 360° vision cupola is a creditable addition and the conventional periscopes are adequate. A wide vision periscope was installed for the dozer operator's use and similar change should be made for all periscopes.

(2) The removal of the T-73 Launcher will remove the cause of the blocked vision of approximately 150° sternward from the 360° vision cupola.

d. Launcher, T-73.

(1) The inaccuracy of the T-73 Launcher is such that its use with the Engineer Armored Vehicle is unwarranted. The pin point accuracy required in the demolition of enemy strong points cannot be obtained with the present elevating mechanism without exposing the crew to enemy fire.

e. Stowage.

(1) Inboard stowage is inadequate as it is desirable that assembled rockets be carried. With possible removal of the sponson type flame thrower, additional stowage space for munitions will be available. A redesign of all stowage compartments and of the deck plates is desirable.

f. M8 Armored Trailer.

(1) As in the case of inboard stowage in the Engineer Armored Vehicle, stowage of assembled rockets is to be desired in the M8 Armored Trailer. A redesign of the stowage compartments and nesting racks is needed.

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g. Flame Thrower - Periscope Type.

(1) In view of the best utilization of inboard space in the Engineer Armored Vehicle and of the inadequacy and poor performance of the M3 POR3 Gun when used in this vehicle, it is recommended that no further consideration be given its use.

h. Radio Installation.

(1) The present radio installation is adequate. Consideration should be given to installing protective armor to prevent mechanical damage to the antenna mountings.

i. M3 Demolition Snake.

(1) In view of the poor vision afforded the driver due to the raised dozer blade and to the possibility of damage to the snake by the dozer mounting brackets, the M3 Demolition Snake should not be launched by the Engineer Armored Vehicle.

j. "Doozit"

(1) The failure of the wooden frame "Doozit" prevented its test by this project but the potential value of this device warrants further consideration. A metal frame "Doozit" carrying shaped charges should be tested.

k. The present arrangement of the sponson door affords the demolition crew a quick and practical means of egress and entrance.

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DESCRIPTION:

1. General Specifications.

a. Vehicle and arrangement. The Engineer Armored Vehicle is a medium tank (M4A3-105) which has been modified for the purpose of providing protection to Engineer assault or demolition parties from small arms fire, shell fragments, and anti-personnel mines. The 105mm. Gun, ammunition boxes and fire control equipment have been removed and replaced by the T-76 rocket launcher. The turret basket has been cut away and miscellaneous boxes have been removed from the sponsons. Splash proof doors have been installed on both sides of the hull and hand rails have been welded to the tank exterior. Stowage compartments for rockets and explosives have been provided in the hull of the tank and are covered with heavy deck plates. A firing cable reel is mounted behind the assistant driver for electric firing. The vehicle has a normal crew of six men. The tank commander and three demolition men are in their respective positions in the turret, with the driver and the assistant driver.

b. Signal Communication. The vehicle is equipped with a long range SCR 508 which is an FM set with both transmitter and receiver and has a range of seven miles. There is also installed in the vehicle a AN VRC/3 which is a modified SCR 300 and is used for maintaining contact with the infantry. A field telephone is installed on the rear of the tank and connected to the tank interphone system.

c. Stowage, Tank. The Tank will carry 24 unassembled rockets and 600 pounds of explosive. If no demolition explosives are carried, 21 unassembled and 3 assembled rockets may be carried in the stowage compartments. If no rockets are carried the stowage compartments will accomodate 30 demolition packs, weighing 18 pounds each, a total of 1620 pounds. These figures are for the 2½" motor rockets only.

d. Stowage, T-8 Armored Trailer. The trailer will carry 21 unassembled rockets and 2500 pounds of explosive. If no demolition explosives are carried 48 rockets may be carried. The rated capacity of the trailer is 2500 pounds.

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e. Accessory - Tank Bulldozer. This is a modified D-8 dozer blade mounted on the front of the tank. The blade is raised and lowered by a hydraulic jack mounted on the tank's front towing lugs. The hydraulic pump and controls are mounted to the right of the driver's seat and are powered by a power take-off from the tank shaft. The blade can be jettisoned from inside the tank by means of a 1/4-inch cable which trips the clamps holding the dozer arms to the bogie support frame and which also pulls the pin holding the blade to the hydraulic jack at the front of the tank. A wide angle (110°) periscope is provided for the dozer operator.

f. Accessory - T-76 Rocket Launcher. This Launcher was designed to fire high explosive demolition rockets at enemy fortifications from close range. The wedge-shaped breech block is so designed as to permit loading and firing the launcher from within the turret, thus affording the crew complete protection at all times. The launcher traverses with the turret, and deflection changes are read on the turret azimuth indicator. Elevation is accomplished manually by the elevating handwheel. The elevation quadrant plate moves with the periscope sight and with the launcher tube so that a relationship is always maintained between the tube and the line of sight.

(1) Characteristics

Muzzle velocity	approx. 800 f/s
Maximum range	approx. 800 ft.
Maximum effective range	approx. 300 ft.
Rate of fire	approx. 4 rds/min

(2) Rockets

(a) T-37, H.E.

Fuse	MD. 146
Body	7.2"
Filler	32 lbs. C2
Motor	2-1/4"
Total weight of round	61 lbs.

(b) T-69, H.E. (Shaped Charge)

Fuse	PIB IV
Body	7.2"
Filler	PTX-2
Motor	2-1/4"
Total weight of round	59 lbs. (approx.)
Penetration	4-5 ft. reinf. concrete.

4. Accessory - Launcher, Rocket, T-73. This is a ten tube multiple 7.2" rocket launcher designed to destroy heavy fortifications at close range. It has the advantage over the T-76 launcher in that it can fire ten rounds as fast as the gunner can press the firing button. It cannot be reloaded without exposing the crew, and it is not as accurate as the T-76. The launcher traverses with the turret and is elevated by electric motor. The elevation indicator is operated by a hydraulic remote control unit Another hydraulic unit is provided to jettison the launcher in the event that it becomes a hazard to the safety of the tank and crew. The launcher is armor-plated with an electrically controlled door over the front for protection against small arms. The T-73 launcher fires the same rockets as the T-76 and, in addition, can fire 7.2" rockets with 4.5" motors.

2. M-8 Armored Trailer. The M-8 Armored Trailer is a two-wheeled rubber-tired vehicle which is towed behind the Engineer Armored Vehicle. A pintle hitch, by which the trailer is towed, is furnished with the trailer and is fastened by steel pins to the towing lugs at the rear of the tank. The trailer has a capacity of 2200 pounds. It is armored on the sides and back with 3/8-inch plate, on the front and covers with 1/4-inch plate, and with 1/8-inch plate on the bottom. It has two hinged covers. The overall length is 115-1/4 inches, the width 88-5/8 inches, and the height 33-1/4 inches. A cable release is attached to the hitch and the trailer can be jettisoned from within the tank when moving forward. The trailer is used for hauling explosives and supplies. It can be easily loaded to capacity of 2200 pounds with packs of C-2 or tetrytol, 50-pound cases of TNT, or rockets and rocket motors.

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3. M-3 Demolition Snake.

a. General. The Snake, Demolition, M-3 consists of two parallel linear explosive charges encased between Aluminum corrugated plates, bolted together to form a rigid assembly which can be towed or pushed by a light or medium tank. It is flexible in a vertical plane to permit it to pass over rough ground and rigid enough in a horizontal plane to maintain a relatively true course when being pushed. The assembled Snake is 14 inches wide, 5 inches high and 400 feet long. It weighs approximately 9,000 pounds, including 4,480 pounds of explosives in the form of elliptical explosive charges. These are 5-3/8 inches wide, 3-3/4 inches high, 5 feet long and weigh 40 pounds. The bulk of the explosive is 80/20 Amatol, with a 6-inch booster charge of crystalline TNT in each end. One hundred twenty-eight cartridges are loaded in 320 feet of the 400-foot Snake, giving an explosive weight of 14 pounds per loaded foot.

b. Effectiveness. The crater, in most soils, will be 320 feet long, 12 to 16 feet wide, with a maximum depth of 3 to 5 feet. The Snake will detonate, destroy, or throw to the side, all antitank and antipersonnel mines in a lane 15 feet wide. Blast-susceptible mines, buried up to 6 inches deep, are detonated in a lane 60 feet wide. Snakes may also be used to break bands of log posts, steel rails, concrete blocks and antitank ditches.

4. "Doozit". A frame mounted on the tank dozer blade may be used to carry a large explosive charge of 1000 pounds or more up to an antitank wall and drop or prop it against the wall to make gaps usable by tanks. The frame, or Doozit, which carries the charge may be built in the field with lumber, or with steel angles and channels. The frame consists of a rack which holds the explosives, and a supporting structure which hooks over the dozer blade. When placed against a wall, the 1000-pound charge is elevated two feet and is in the form of a bar 9-1/2 feet long, 22 inches high and 9 inches thick. Good contact of the explosives with the wall is obtained on vertical and sloping walls. It is important that the bolt from which the explosives rack hangs be located so that there is as much weight forward of the bolt as there is to the rear of it, or, it must be in the plane of the center of gravity - from front to rear - so that the load will hang properly.

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5. Mechanized Flamethrower M3-4-E6R3.

a. The Mechanized Flamethrower M3-4-E6R3 is a weapon for attacking small fortifications from very close ranges. It must be supported by other fire power during attacks. Fuel is propelled toward the target by means of compressed air. As fuel leaves the gun, it is ignited by a small flame of atomized gasoline which, in turn, is ignited by a sparkplug.

b. The main groups of the flamethrower are (a) the sponson group, (b) the transmission fuel group, and (c) the gun group. The transmission fuel group is not used on the Engineer Armored Vehicle because the power take-off from the transmission for the hydraulic control of the bulldozer blade occupies the space used for this group.

c. The sponson fuel group has a fuel container for storing 25 gallons of either liquid or thickened fuels. A pressure container of air at 2100 p.s.i. is the source of the propelling force. This high pressure is reduced to an operating pressure of 375 p.s.i. by a pressure regulator before entering the fuel container. This pressure forces the fuel through a flexible hose to the gun fuel valve.

d. The gasoline reservoir and the spark-atomized gas ignition system are located in the gun group. Electricity for primary ignition is supplied by the vehicle's batteries. Air, for burning the atomized gasoline, is by-passed to the gun group after leaving the pressure regulator. Pulling the trigger operates the sparkplug and simultaneously regulates the flow of air, gasoline, and fuel through the system. The fuel is discharged through an L-shaped barrel which extends through a special periscope holder in the hatch.

e. Either liquid or thickened fuel may be used with the gun.

f. The maximum effective range with liquid fuel is 20 to 30 yards and, with thickened fuel, is 40 to 60 yards. The flamethrower is generally fired in bursts of 2 to 4 seconds each. The time of one continuous burst is from 20 to 35 seconds, dependant upon the size of the nozzle.

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TESTS:

TEST #1 - ACCURACY, EFFICIENCY, DURABILITY AND RATE OF FIRE OF THE MODIFIED T-76E1 ROCKET LAUNCHER.

SUB-TEST #1a - ACCURACY

Purpose:

1. The purpose of this test was to determine the maximum effective range and accuracy of the T-76E1 launcher firing 2¾" Rockets, HE,T-37, HE,T69 shaped charge and T44E1 practice.

Method:

1. Firing from a fixed position sighting shots using inert rounds were fired to determine the quadrant elevation for the desired ranges.

2. The target was a vertical reinforced concrete wall marked off in grid patterns by lines one foot apart in both vertical and horizontal directions. The center lines were prominently marked to serve as an aiming point.

3. The ranges used were 100, 200 and 300 feet.

Results:

1. At a range of 100 feet, at a corresponding angle of elevation of approximately 5°, the horizontal dispersion was approximately two feet and the vertical dispersion approximately 2-1/2 feet in a ten-round group.

2. At a range of 200 feet and elevation of 9°, the group opened considerably and 11 rounds showed a horizontal dispersion of 8.2 feet and a vertical dispersion of 6.4 feet. The center of impact moved approximately one foot to the left of the point of aim and remained approximately at the same height as the point of aim.

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3. At a range of 300 feet and an elevation of 11.5°, a group of nine shots showed a horizontal dispersion of 6.2 feet and a vertical dispersion of eight feet.

4. Figures #3, #4 and #5 indicate the pattern of the shots and groups at the respective ranges discussed above.

5. From the results of practice firing in the above and other shots, the maximum effective range for acceptable accuracy is deemed to be 300 feet, using 2-1/4" motors.

SUB-TEST #1b - EFFECTIVENESS.

Purpose:

1. The purpose of this sub-test is to determine the effectiveness of the T-76E1 launcher firing the prescribed ammunition against enemy fortifications.

Method:

1. Utilizing the concrete structures built for the purpose (See Figure #6), sufficient rounds of ammunition T-37,HE and T-69,HE shaped charges were fired to accomplish the demolition of the fortified positions and structures.

2. Firing from a fixed position and at pre-determined ranges, firing orders are transmitted to the tank commander by the officer in charge of tests. Observation by periscope from an advanced position permitted the close scrutiny of damage.

Results:

1. The first target selected for this test was the concrete wall and shaped charges were fired against the section four feet thick.

2. Penetration was complete (See Figure #7), and some shattering effect was evident at the exit point of the blast (See Figure #8). The face of the wall at the point of impact was shattered in a crater approximately two feet in diameter

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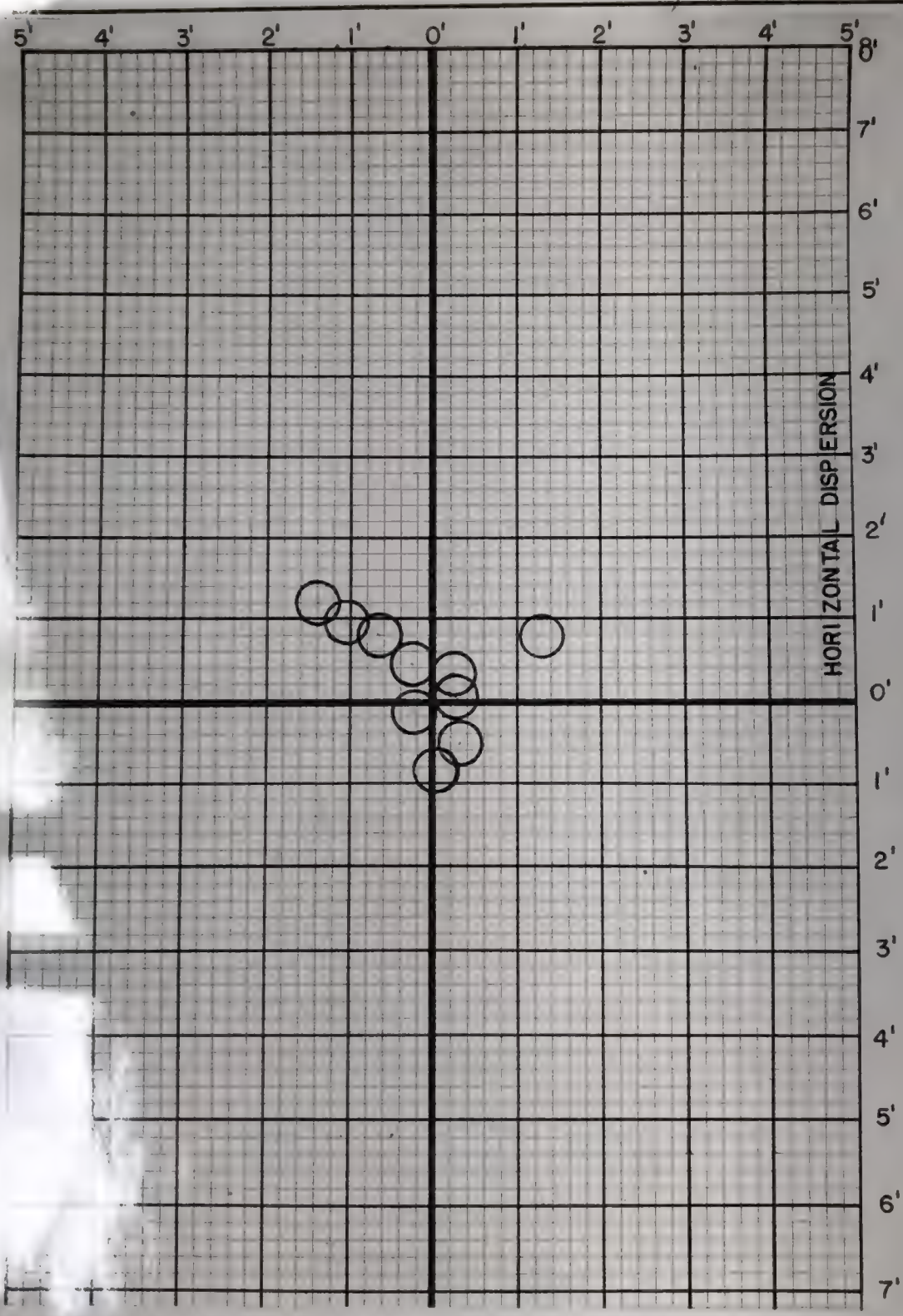

FALL OF SHOTS
T-76 LAUNCHER — INERT T-37 SHELL
2-1/4" MOTOR - ELEVATION 5°
RANGE 100 FT.

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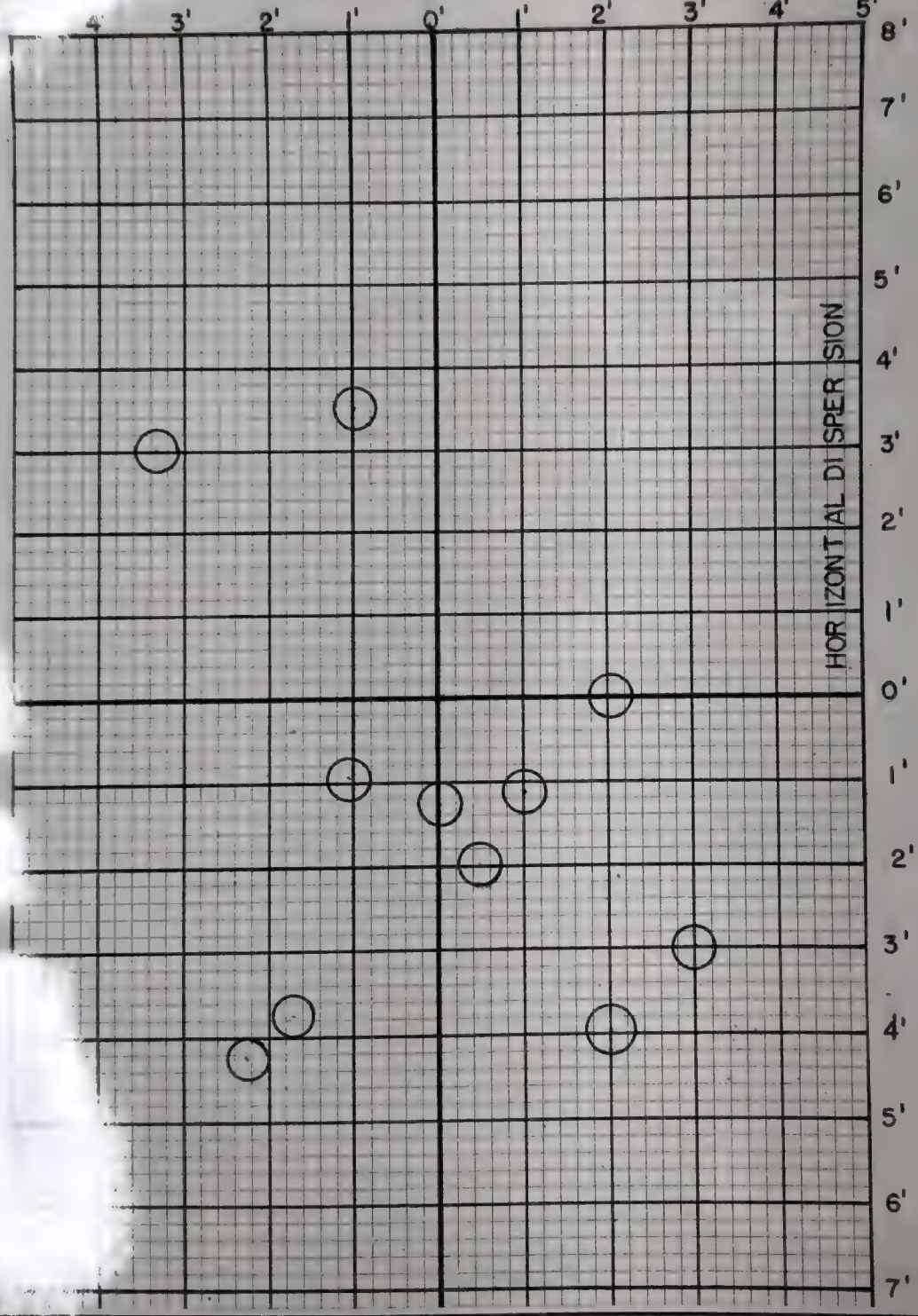
FIG. 3



FALL OF SHOTS
T-76 LAUNCHER – INERT T-37 SHELL
2-1/4" MOTOR – ELEVATION 9°
RANGE 200 FT.

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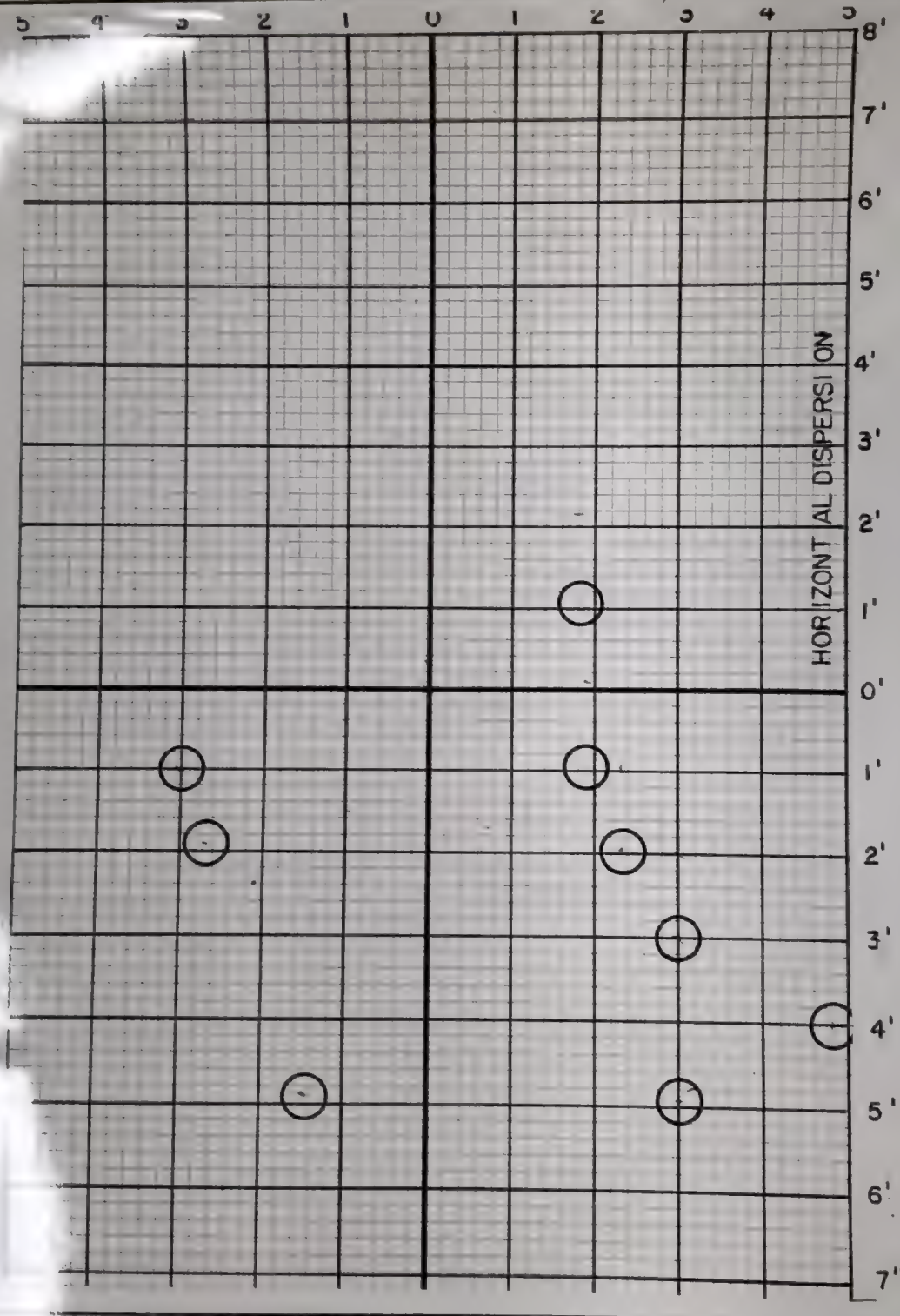
FIG. 4



FALL OF SHOTS
LAUNCHER- INERT T-37 SHELL
-1/4" MOTOR- ELEVATION 11.5°
RANGE 300 FT.

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FIG. 5

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FIGURE #6

Diagrams for concrete structures and targets.

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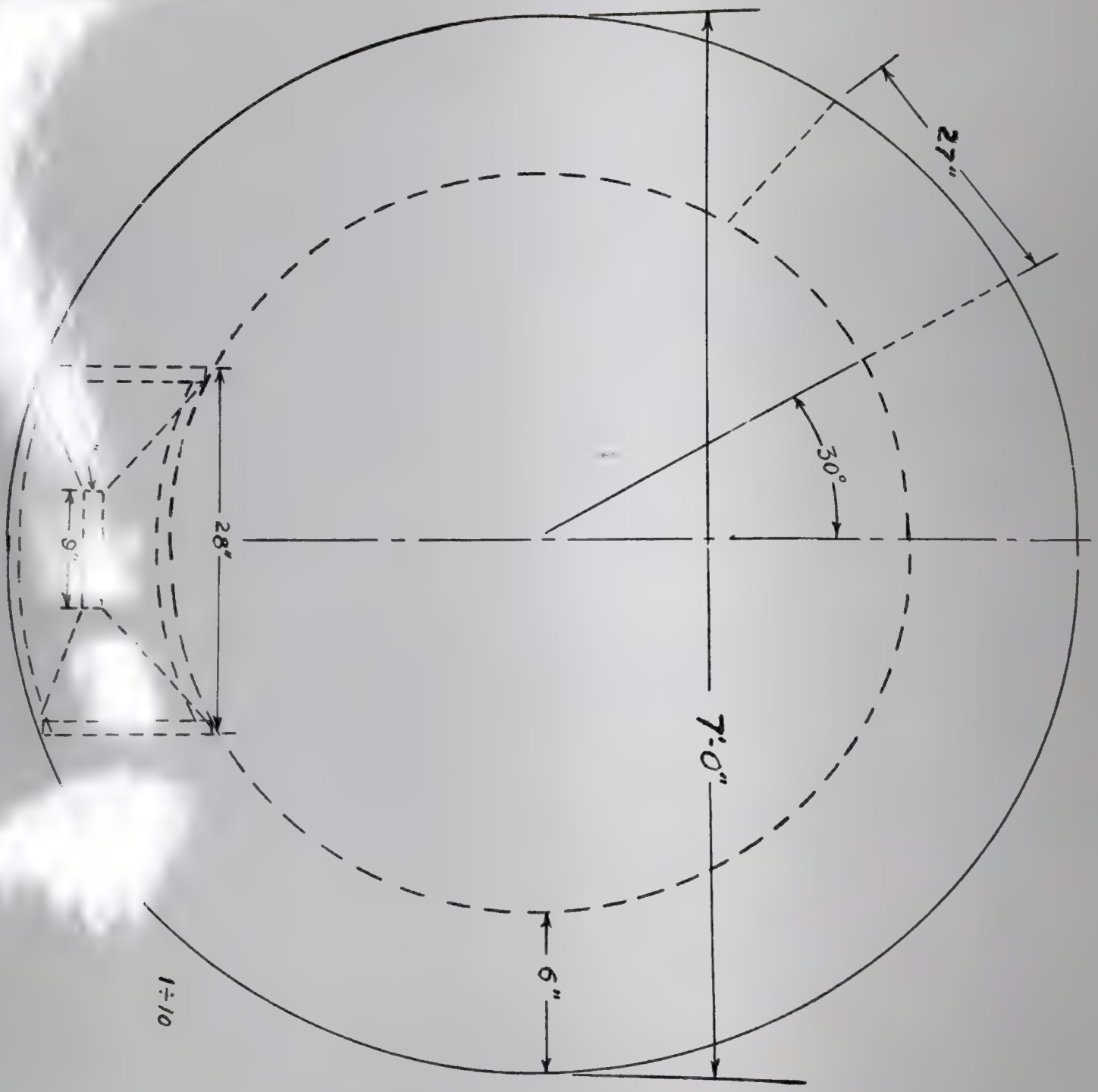
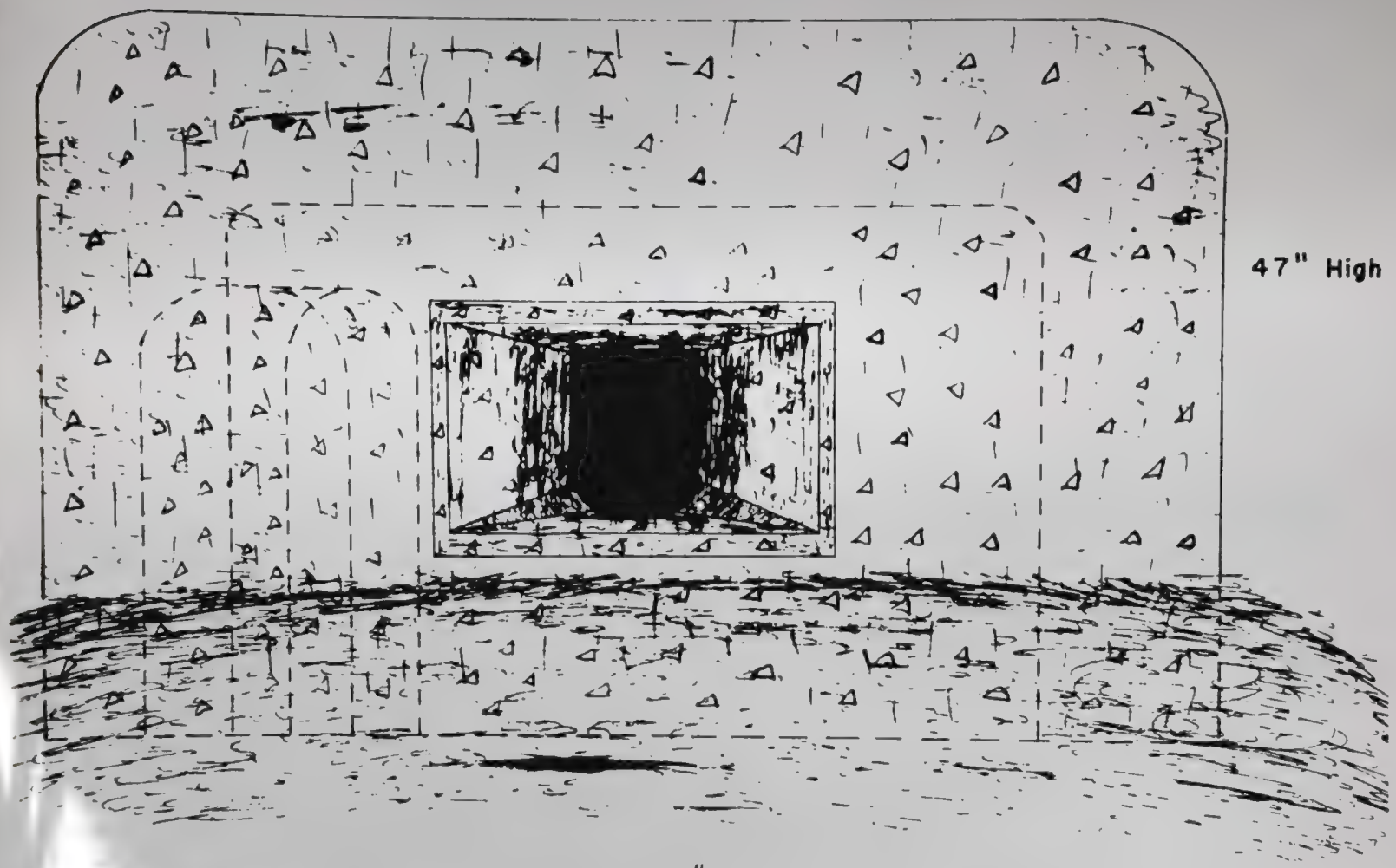
PLA



CONCRETE PILLBOX TARGET



47" High

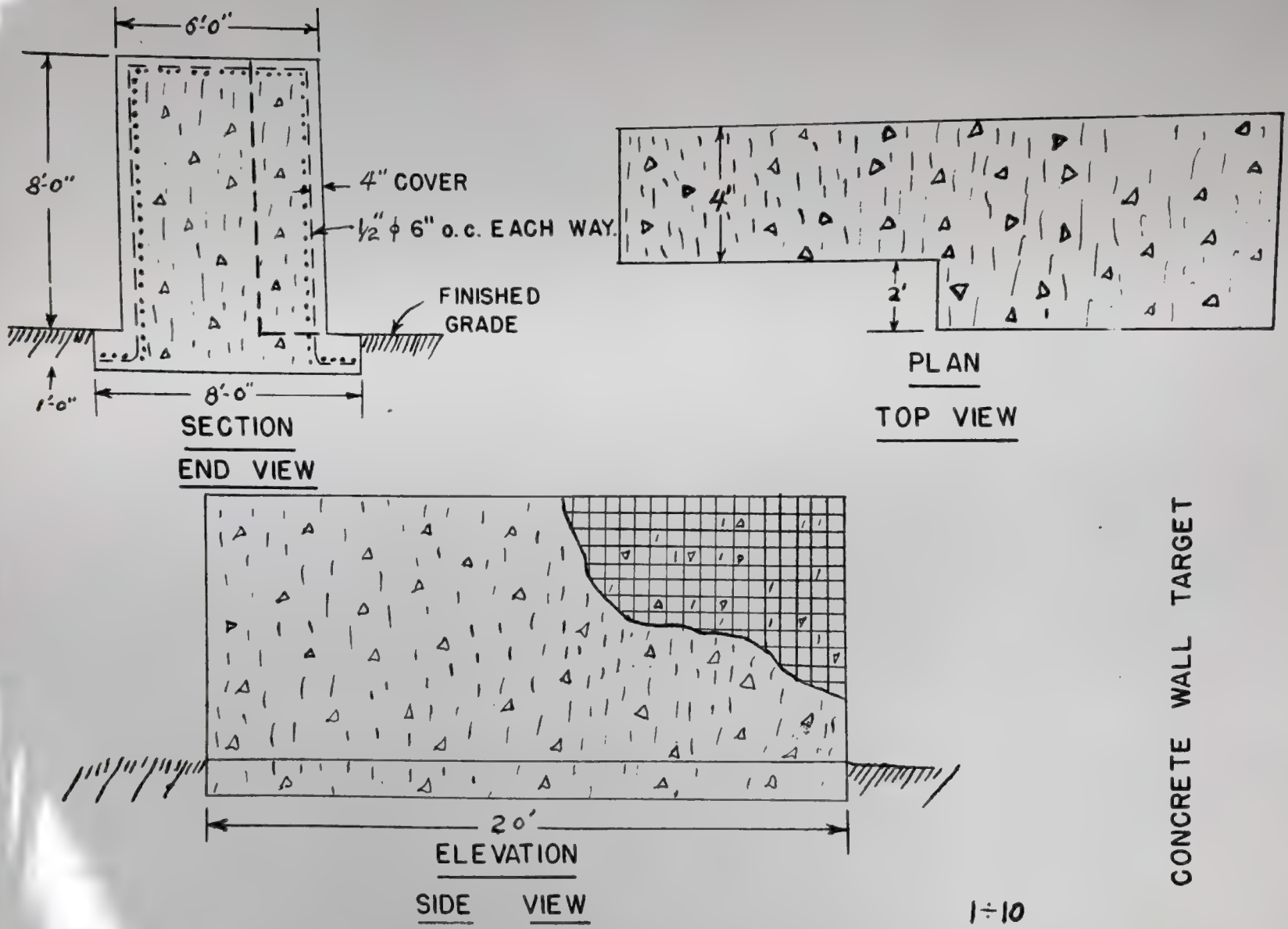
CONCRETE PILLBOX TARGET

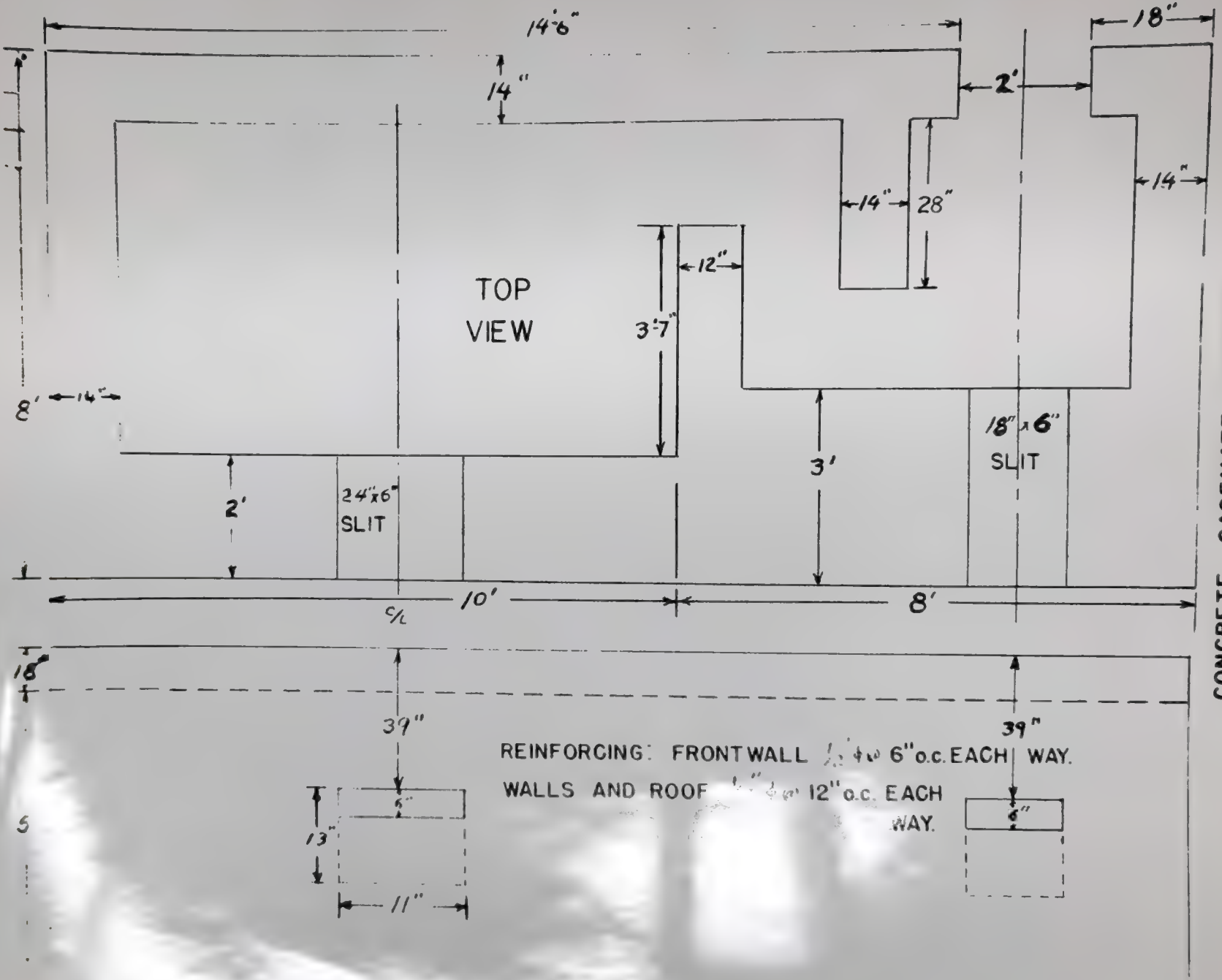
[illegible]FORCING EXTERIOR FACE OF WALL ½" ϕ 6" o.c. EACH WAY

RE[illegible]ORCING ROOF SLAB ½" ϕ 6" o.c. EACH WAY.

1÷10

ELEVATI[illegible]


6'-0"
8'-0"
4" COVER
½" ϕ 6" o.c. EACH WAY.
FINISHED GRADE
1'-0"
8'-0"
SECTION
END VIEW
4"
2'
PLAN
TOP VIEW
20'
ELEVATION
SIDE VIEW
1÷10
CONCRETE WALL TARGET


14'-6"
18"
14"
2'
14"
14"
28"
12"
TOP
VIEW
3'-7"
8'
14"
18" x 6"
SLIT
3'
2'
24" x 6"
SLIT
10'
8'
C/L
18"
39"
39"
REINFORCING: FRONTWALL
6" o.c. EACH WAY.
WALLS AND ROOF
12" o.c. EACH
WAY.
6"
13"
11"
CONCRETE CASEMATE TARGET

and six to eight inches deep. At the bottom of this crater, a hole approximately two inches in diameter was punched through the concrete. The path of this punched hole was erratic and point of emergence was approximately one foot displaced from the point of entrance. Large portions were cracked from the rearward face and held in position by the reinforced rods, but many small fragments were blown clear and scattered over the area to the rear of the wall. Large cracks radiated from the hole caused by the blast of the shaped charges.

3. Subsequent shots with shaped charges and H.E. (See Figures #9 to #14 inclusive) still further weakened the wall, and the major portion of a wall section approximately 10 feet long and eight feet high and four feet thick was criss-crossed with numerous wide fissures, and that portion remained standing apparently because of the reinforcing rods. The destruction of that portion of the wall is recorded in the accompanying motion pictures forwarded as Enclosure "A".

4. The second target chosen was the concrete casemate (See drawings under Figure #6). The face of the casemate was protected by a log and dirt revetment 8' thick. The test called for the use of H.E. to remove the revetment and for an attack against the thus exposed concrete with shaped charges.

5. Four rounds of H.E. demolished the log revetment and exposed the concrete face of the structure. An assault with four rounds of shaped charges completely shattered the face of the firebay and badly cracked the rear of the structure.

6. The third target was a circular concrete pillbox covered with a log and dirt revetment. Because of the low silhouette, three ricochets and one dud resulted in nine rounds of H.E. fired. The five effective rounds demolished all revetments and neutralized the pillbox by throwing a five foot covering of dirt over the embrasure. The structure as a whole was slightly displaced and tipped. The exit was blocked by rubble. The ground had been saturated by three days of heavy rain. The target was not demolished but was effectively neutralized. Motion pictures recorded the firing at this target and are a part of Enclosure "A".

FIRST SHOT, SHAPED CHARGE,
FOUR-FOOT SECTION.
PENETRATION COMPLETE.
FISSURE TO THE RIGHT CORNER.

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FIRST SHAPED CHARGE.
DAMAGE AT BACK OF WALL,
FOUR-FOOT SECTION.
NOTE COMPLETE FRACTURE AT BASE OF WALL.

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FIG. 8

FIRST SHAPED CHARGE,
6-FOOT SECTION.
DID NOT PENETRATE.

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FIG. 9

SECOND SHAPED CHARGE
6-FOOT SECTION
PENETRATION ACCOMPLISHED

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FIG. 10

BACK OF WALL,
6-FOOT SECTION,
CRACK APPEARS AT BASE OF WALL AFTER SECOND
SHOT. (SEE FIG. 10)

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FIG. 11

FOUR-FOOT SECTION AFTER
TWO ROUNDS OF H.E.

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FIG. 12

FOUR-FOOT SECTION AFTER
SIX ROUNDS OF H.E.

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FIG. 13

BACK OF WALL AFTER
SIX ROUNDS OF H.E.

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FIG. 14

FRONT OF WALL BEFORE TEN ROUNDS RIPPLE FIRE H.E.

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FIG. 15

FRONT OF WALL AFTER TEN ROUNDS RIPPLE FIRE H.E.

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FIG. 16

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FIRST ROUND AGAINST LOG AND DIRT REVETMENT OF CASEMATE. NOTE LOGS AND DIRT FLYING

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SECOND ROUND H.E.
AGAINST CASEMATE

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FIG. 18

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FIRST SHAPED CHARGE FIRED
AGAINST CASEMATE.

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FACE OF CASEMATE AFTER
FOUR SHAPED CHARGES.
ROOF 18 INCHES THICK,
FRONT WALL TWO FEET THICK.

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FIG. 20

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SUB-TEST #1c - RATE OF FIRE.

Purpose:

1. The purpose of this test was to determine the approximate rate of fire possible of accomplishment under normal firing conditions.

Method:

1. Measure of the rate of fire is afforded for a study of time required for the 195 rounds fired during all drills and tests. In all, 135 T44E1 Inert, 40 T37 H.E. and 20 T69 H.E. shaped charges were fired from the T-76 launcher.

Results:

1. The rate of fire of the T76E1 launcher as installed is approximately four rounds per minute.

2. With modifications to the existing equipment as tested, this rate will undoubtedly be increased as the difficulties attendant the loading and sighting of the launcher can be greatly alleviated by modifications in design.

SUB-TEST #1d - DURABILITY

Purpose:

1. The purpose of this test was to determine the durability of the T-76 launcher.

Method:

1. The method pursued in determining the durability was a close observation of the operational details of the launcher and of the accessories needed for its operation.

Results:

1. While no evidence existed to show that extreme wear or damage was caused by the firing of 195 rounds, the operational

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details of the launcher can be subjected to modification for the better performance of the launcher. A failure of the insulation in the stop assembly was experienced indicating a potential source of trouble. The sighting system is not the ultimate in convenience or simplicity, and the need for a complete redesign of the sighting mechanism is indicated.

2. The breech mechanism is awkward. It is difficult to operate and during prolonged firing becomes extremely hot, - to the great discomforture of the loader.

3. Firing during wet weather and with wet ammunition introduced difficulties in that poor contacts or short circuits prevented the firing of the rockets. The misfires were wholly due to the electrical system of the launcher as in no case after cleaning the launcher, contacts and ammunition was there a failure to fire. It is therefore recommended that an expendable removable cover be placed over the firing bands and the lead wires. This will alleviate the dirt and water problem and prevent the fouling of the lead wires. A more flexible and stronger lead is desirable as the present leads are easily broken.

4. Some difficulty was experienced with blow back at the seal between the tube structure and the breech block. The replacement of the gasket alleviated this condition.

5. In view of the ignition difficulties, it is recommended that a 45-volt battery with independent leads be utilized as a standby in the event of the failure of the primary ignition circuit.

6. In view of the contemplated installation of the T105 launcher, the modifications discussed above are not imperative.

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TEST #2 - EFFECTIVENESS OF THE TANK DOZER BLADE WHEN USED ON [illegible] AMPHIBIOUS VEHICLE.

Purpose:

1. The purpose of this test is to determine, by trial, the effectiveness of the blade for its intended use in combination with the EAV.

Method:

1. By trial, in the moving of masses of earth and the clearing of debris from demolished concrete walls, the bulldozer blade and its combination with the EAV was studied.

Results:

1. The performance of the blade was satisfactory in moving large masses of earth as in the construction of an anti-tank ditch approximately 200 feet long, 6-1/2 feet deep, and approximately 15 feet wide. The EAV has ample power and the mounting of the bulldozer blade is satisfactory for that work in which it is expected that the vehicle will be involved. It will be borne in mind that normal dozer tasks in rear areas can be better accomplished by the standard dozers available for this work.

2. The dozer blade successfully filled in an anti-tank ditch to permit the crossing of the ditch (Figures #21, #22 and #23), and although no actual attempt was made to build earth ramps for passage over anti-tank walls, the capabilities of the blade are such that this can be accomplished without great difficulty.

3. The building of extensive earth works which occasion long periods of running in low gear or in reverse introduces hazard in that there is a tendency to race the engine because of the low gear ratio. The use of the dozer blade for removal of debris from shattered concrete walls (Figure #24) is as effective as can be expected with the limited vision afforded the driver.

4. Efforts to raise the dozer blade while under load and moving an earth mass failed as the hydraulic system has not sufficient power to lift the blade clear of the earth mass unless the vehicle is backed. This problem is slightly simpler while the tank is up hill but is not possible when the tank is inclined downward. An increase in cylinder size or in cylinder pressure is necessary to permit a more facile use of the blade.

5. No studies were made of the effectiveness of the blade in uprooting anti-tank or anti-personnel mines as the necessary mines and blade attachments were not available and the time schedule would not permit.

6. The dozer blade was successfully jettisoned and picked up (Figures #25, #26 and #27). The operation is aided if the tank is on a slight upward incline. Only three men are needed outside the tank to pick up the blade, to align the side arm trunnion couplings and to secure the hydraulic jack.

BULLDOZER BLADE BEING
LOWERED TO FILL IN
ANTI-TANK DITCH

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DOZER BLADE IN ACTION

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DITCH FILLED AFTER FIVE DOZER LOADS. TANK CROSSING AND EMERGING

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BLADE IN POSITION FOR
REMOVAL OF WALL DEBRIS.

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DOZER BLADE FREED FROM
TRUNION AND HOIST
BLADE BEING JETTISONED

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BLADE BEING PICKED UP.
CREW ENGAGING HYDRAULIC LIFT.

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DETAIL STARBOARD DOZER
BLADE ARM TRUNION DISENGAGED

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TEST #3 - ADEQUACY OF PERISCOPES.

Purpose:

1. The purpose of this test was to determine the adequacy of the periscopes in matters of visibility and to determine the value of the 360° vision cupola.

Method:

1. The range of vision through each of the periscopes was determined by observation.

Results:

1. With the exception of the wide angle periscopes which had been provided for the driver, the remaining periscopes of the EAV were standard for the M4A3 tank.

2. It is the opinion of the Equipment Board that the wide angle periscope should be provided wherever possible. The 360° vision cupola was considered to be excellent in its intended purpose, but the installation of the T-73 rocket launcher limits the arc of the field of vision by blocking out the sternward sector involving approximately 150°. The contemplated removal of the T-73 launcher should alleviate this condition and afford the complete vision for the full 360°.

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TEST #4 - ROCKET LAUNCHER T-73.

Purpose:

1. The purpose of this test was to determine the accuracy, dependability and operational features of the T-73 launcher (Figures #28 and #29).

Method:

1. By field and firing tests and extensive drills, the effectiveness and use of the launcher was determined.

Results:

1. This is a ten-rail short-barreled armored launcher mounted in trunnions above the turret of the tank and controlled in elevation by an electric motor and gear train operated from within the tank. A hydraulic system is provided to permit the jettisoning of the launcher either to remove it while loaded as a potential danger source or to discard it when the rails are empty and no opportunity is available for reloading.

2. Frequent attempts were made to determine the elevation and to attain a correct elevation by use of the elevating gear and the sighting mechanism provided. The correct laying of the launcher was impossible except by pure chance due to the fact that, as the launcher was raised or lowered in elevation, the electric motor overran the desired point and gave excessive or insufficient elevation. The inertia of the motor and of the gear train is sufficient to carry the launcher through an appreciable angle of elevation or depression after the power to the motor has been shut off. In measuring the accuracy of the launcher in either single or ripple fire, it was necessary to check the angle of elevation by placing a gunner's quadrant on the launching rails. This required that crew member climb to the top of the tank. Such a procedure in combat would be prohibitive.

4. When once correctly layed and with clean contacts, the launcher fired normally and the electrical system when clean and dry is practical though complicated and vulnerable.

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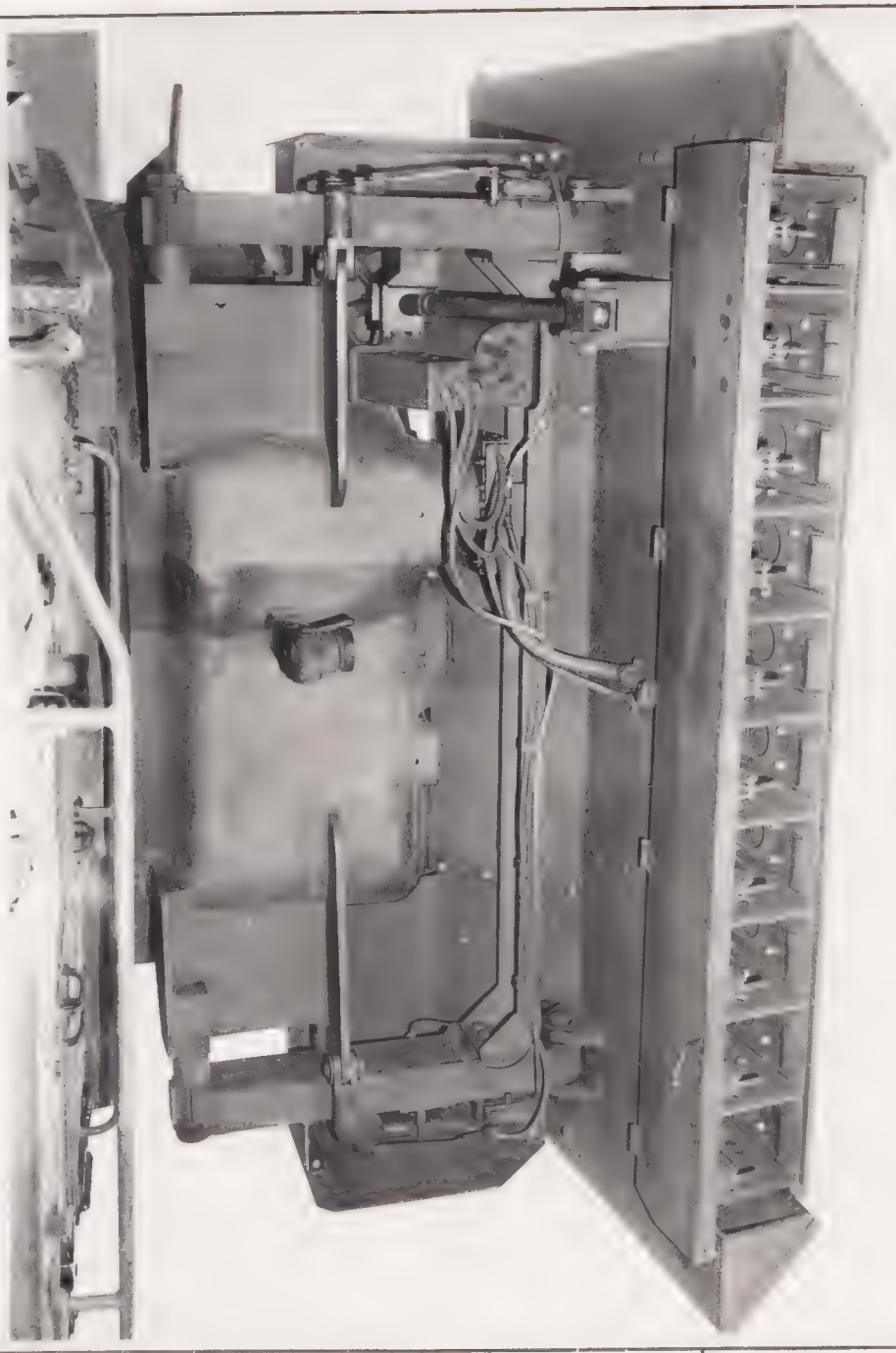
5. The first ten rounds fired ripple fire using projectile T37, H.E., was at the wall target from a range of 100 feet. All impacts were on the target and accomplished the complete demolition of the wall (See Figure #16). This range was determined as the maximum effective range, as beyond this distance the dispersion is so great that point target firing would be deemed impractical with the present ammunition and launcher combination.

6. In the second attempt at ripple fire with ten rounds of T37, H.E., the electrical firing system failed due to rain and resulting short circuits.

7. Assuming that the T73 multiple rail launcher can be perfected in its performance and the malfunctions now encountered can be eliminated, its inherent disadvantages will still be maintained. The inaccuracy at ranges beyond 100 feet, the high silhouette, the danger to crew by enemy fire, the danger to friendly troops when jettisoned with rockets, the masking of the full vision cupola, the interference with the topside hatches, the addition of an unbalanced 3,000-pound weight which interferes with turret manipulation, the vulnerability of rocket load to enemy fire over 20mm in caliber, the difficulty and hazard encountered in loading the launcher under combat conditions, all these detract immensely from any potential assault value of the weapon. During the tests and preliminary rehearsals, the explosion of an 18-pound satchel charge at a distance of 30 feet from the rear of the LAV carried away two of the firing connections to the launchers. A short circuit due to the damage started a fire in the electrical system which required the replacement of the system.

8. It is the confirmed opinion of the Equipment Board that the use of the vehicle would be enhanced greatly by the removal of the T-73 launcher until and unless a practical elevation mechanism and sighting system is provided.



T-73 LAUNCHER (REAR VIEW)
NOTE VULNERABILITY OF
ELECTRICAL CONNECTIONS

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LOADING T-73 ROCKET LAUNCHER.
SMALL ARMS PROTECTION DOOR RAISED.
NOTE INTERFERENCE WITH TURRET HATCHES.

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TEST #5 - INNER COMPARTMENT STOWAGE CAPACITY FOR ROCKETS AND EXPLOSIVES.

Purpose:

1. The purpose of this test was the study of stowage capacity for rockets and for demolition charges with view to determining the maximum possible stowage in varying combinations dependent upon (a) the eventual weapons of the vehicle, (b) the type of mission.

Findings:

1. The present stowage area of the EAV is workable but awkward when used on a rocket firing mission typical to that of the demonstrated tests. On a mission which will require the expenditure of large numbers of projectiles, the stowage must be rearranged if full effectiveness of the vehicle's potentialities are to be realized.

2. The starboard compartment under the pedestrian deck provides for the stowage of 18 motors and 21 projectiles when unassembled. For the expeditious handling of ammunition and loading of the T76 launcher, it is desirable that the rockets be stowed assembled. The starboard compartment thus must be redesigned to permit the horizontal stowage of the assembled rockets. During the tests and demonstrations, the total rocket load consisted of 21 unassembled rockets, three motors of which were carried in the starboard sponson space, three assembled rounds were carried behind the driver's seat, and two ready rounds were available on the deck plates. Two unassembled rockets were carried in the aft port side compartment. Two unassembled rockets were in the outboard port compartment and in the port side forward compartment, two unassembled rockets made up the complete rocket stowage within the vehicle, - a total of 30 rockets. The demolitions on board were 15 pounds of 2-1/2 pound hand charges, stowed in the port side sponson area.

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3. The stowage of this number was possible only by utilizing improperly designed compartments for the stowage of urassembled rockets. A complete redesign of the section will permit added rocket stowage of assembled munitions. If the mission should occasion a demand for demolition charges only, their stowage in any of the compartments capable of stowing assembled rockets is a simple matter. Such flexibility, in proportion of rockets and demolition charges, is necessary as the varying missions will demand.

4. When loaded only with demolition packs, the present stowage arrangement permits a total load of 1620 pounds. The redesign will affect this total load but little, except that the removal of the flame thrower will increase the vehicle's capacity by 1000 pounds over the present capacity within the stowage compartments.

5. The present pedestrian deck plate has a jackknife hinge and is awkward to handle and a hazard in the handling of ammunition during a firing mission. It is desirable that the plates be changed to a simple lift plate equipped with hand holes and arrangements by which the plates can be slid from one side to the other rather than the present arrangement which requires that the plates be up-ended. Such an arrangement of plating would greatly improve the working space. With the elimination of the flame thrower, the present space in the starboard sponson occupied by the fuel group will permit additional stowage capacity for approximately 12 2-1/4" motor rockets assembled.

6. In the study of the rearrangement of stowage space, consideration should be given to the installation of a more complete and automatic fire fighting system to supplement the present inadequate hand extinguishers.

TEST #6 - USE OF SIDE PORTS BY DEMOLITION CREW.

Purpose:

1. The purpose of this test is to determine the efficiency and speed with which engineer demolition crews can enter and leave the vehicle through the side port.

Method:

1. In simulated drills and in practical tests the four-man demolition crew used the side ports for their intended purpose. The time necessary to open the doors, for three men to leave the tank, obtain their charges from inside the tank, to throw the charges and return to the tank, closing the door was recorded (See Figures #36 and #37).

Results:

1. When the tank commander remains within the tank and a three-man crew leaves the tank and remains on the lee side of the tank within its cover and each throws four 2-1/2 pound demolition charges, the elapsed time for the complete cycle is approximately 25 seconds. This average time is for the throwing of the 2-1/2 component charge using a M6A3 4.8 second detonator.

2. When heavy demolition charges of from 18 to 40 pounds are used which require fuze timing of approximately 15 seconds minimum, two men can place 70 pounds of demolition pack 30 yards from the tank and return to the tank in 30 seconds. It will be appreciated that the tactical situation will cause a variance in this time, and lack of enemy opposition in a demonstration provides always the most advantageous conditions.

3. Discounting for the moment the possible changes in the total armament of the LAV, its use as a vehicle for demolitions through hand-placed charges is a vast improvement over the movement on foot of the present demolition squad.

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STORAGE SPACE EMPTY

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STOWAGE OF UNASSEMBLED
ROCKETS & DEMOLITIONS.

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STOWAGE OF UNASSEMBLED
ROCKETS IN PORT & STBD. COMPARTMENTS

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PEDESTRIAN DECK CLOSED

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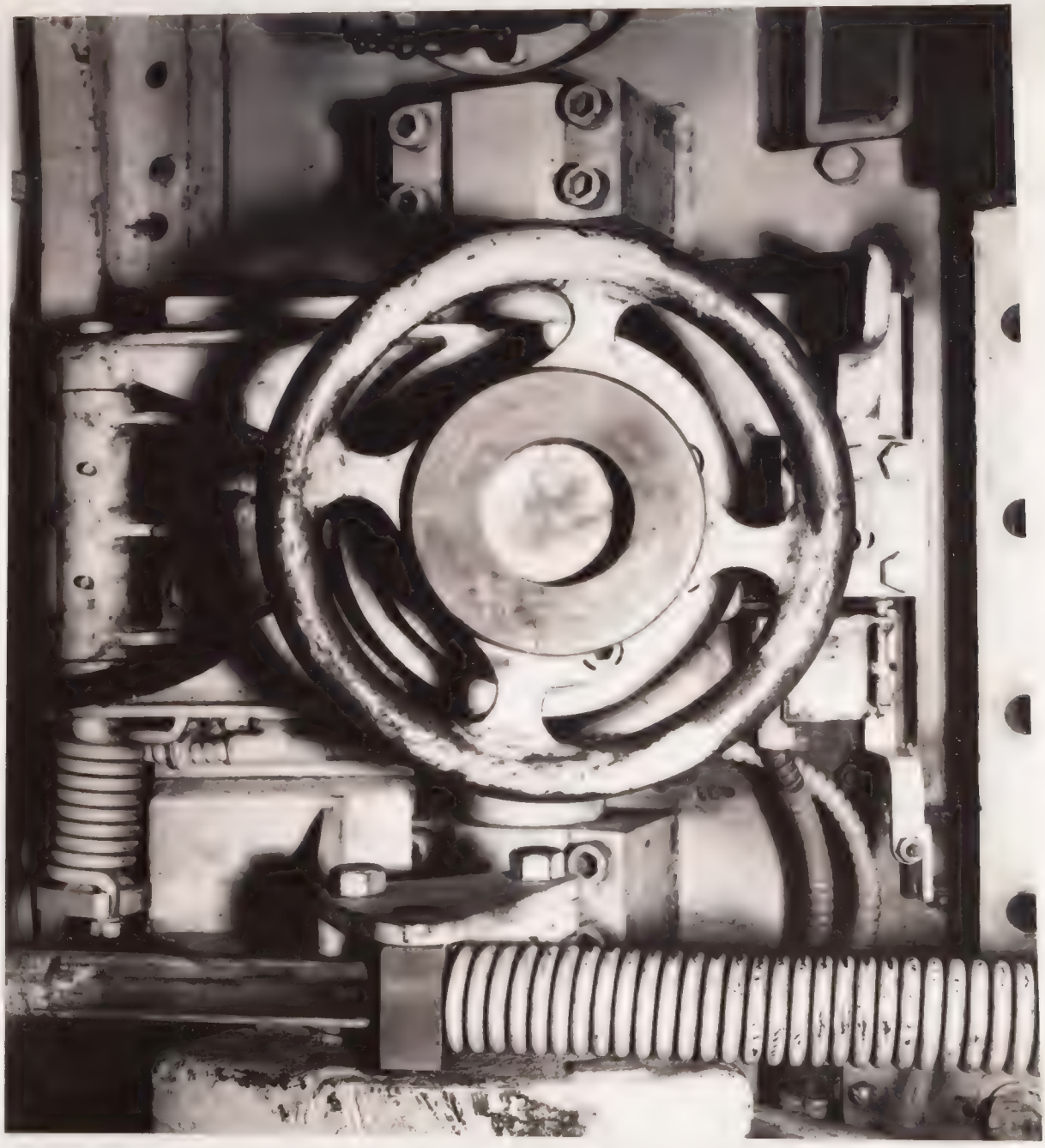

T-76E1 LAUNCHER INTERIOR
(BREECH MECHANISM CLOSED)

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T–76E1 LAUNCHER INTERIOR
(BREECH MECHANISM OPEN)

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DEMOLITION CREW IN LEE OF TANK
AFTER DISMOUNTING VIA SPONSON DOOR.

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HAND THROWN 2-1/2 LB. DEMOLITION CHARGES
BEING THROWN FROM LEE OF TANK

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TEST #7 - M-8 ARMORED TRAILER.

Purpose:

1. The purpose of this test is to determine the characteristics and practicability of the M-8 Trailer, as an accessory to the EAV (See Figures #38, #39 and #40).

Method:

1. On receipt of the trailer, modifications were made in the stowage compartment. Partitions were erected athwartship of the trailer compartment to divide it into two compartments equal in size. In the forward compartment, a nesting rack was constructed to provide for stowage of 21 projectiles and 18 2¼" rocket motors. The after compartment, for the stowage of demolition packs, accommodates 1500 pounds, or approximately 85 18-pound packs.

2. In the demonstrations and tests of the EAV, the M-8 Trailer was utilized as an ammunition carrier.

Results:

1. In these tests, the M-8 was a satisfactory means of transporting a supplementary supply of rocket ammunition and demolition packs.

2. The pintle hitch by which the M-8 Trailer is attached to the tank required modification for attachment to the M-4 tank. As shown in Figure #40 an offset was made to accommodate the sloping rear plate above the exhaust vents. As received, the pintle hitch is straight. With the hitch modifications, as shown in Figure #40, it can be and was successfully jettisoned by a steel cable which enters the pistol port.

3. With the contemplated installation of the T-105 rocket launcher using the 4½" rocket motor, further modifications will be necessary to the trailer to provide for the proper stowage of this larger ammunition. In this report no recommendations for future modification to the M-8 Trailer can be made until the T-105 launcher is installed and the larger ammunition for this launcher is available.

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M8 ARMORED TRAILER
COVER DOOR CLOSED
LATCHING HOOK ENGAGED

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FIG. 38

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M8 ARMORED TRAILER, COVER DOORS OPEN
FORWARD COMPARTMENT 21 PROJECTILES AND 18 MOTORS
AFTER COMPARTMENT 1500 LBS. DEMOLITION PACKS
(18 LBS. EACH)

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PINTLE HITCH FOR M8 ARMORED TRAILER. NOTE THE BEND AT THE EDGE OF EXHAUST VENTILATION PORTS

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FIG. 40

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TEST #8 - RANGE AND EFFICIENCY OF THE 50-GALLON SPONSON TYPE [illegible].

Purpose:

1. The purpose of this test, as directed by the basic directive, reference (b), was for the performance of the 50-gallon Sponson-type Flame Thrower intended for use with the ball turret. This unit was not installed but, in its stead, a Periscope type of gun was installed. The test therefore involved an investigation of the capabilities of the flame thrower fuel storage group mount in the starboard Sponson but connected to the Periscope type of gun, M-3 M3R3.

Method:

1. After installation, the flame thrower was operated on mixtures of gasoline and fuel oil, and with thickened fuel, for test of range and effectiveness. The maximum effective range of the flame thrower was 40 yards when using the thickened fuel. The elevation used at the range was approximately 220 mils. In the test, the thickened fuel was of slightly lower viscosity than considered best for maximum range. A higher viscosity will, from other tests, increase the range approximately 10 to 20 yards. (See Figures #41 and #42). The periscope type of gun can be traversed 90° right and 45° left. At short ranges the Boxer hydraulic lift masks the gun between 10° left and 25° left. If the rocket launcher tube is at 0° elevation, the firing to the left is limited to 10°.

2. The fuel group in the Sponson functioned satisfactorily during all tests but the gun group M3R3 functioned satisfactorily only once during the firing. The first firing of the flame thrower revealed a major defect in the gun group. When the air-line valve on the fuel group was opened, air escaped through the gun group and could not be controlled by the gun group trigger. This did not prevent the gun from firing but allowed the escape of an excess of air which resulted in insufficient remaining pressure to expel the last gallons of fuel. On return to Edgewood Arsenal on repair, it was found that foreign matter had clogged the valves.

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3. The fourth and fifth attempts to fire were unsatisfactory due to a leaking fuel valve. After firing a short burst the fuel valve plunger failed to seat properly which allowed fuel to drip onto the forward end of the tank. Releasing the trigger failed to close the valves and the trigger had to be forced forward manually after firing a burst. During the last burst, the operator inadvertently directed the flame against the hydraulic lift of the Dozer blade. Burning fuel was spattered over the forward end of the tank and some entered the tank either through the periscope or the joint of the hatch opening (See Figure #43). A serious fire occurred inside the tank which required the expenditure of all extinguishers carried inboard, and forced the evacuation of the tank. The situation was critical as live ammunition and demolition charges were stored in the compartment directly to the rear of the assistant driver's position.

4. It is the concerted opinion of all observers that the M-3 E6R3 flame thrower is a serious hazard when used on the EAV. The firing radius and the range are greatly limited by other attachments to the vehicle, fuel capacity is small, and accessories necessary for serving the flame thrower are excessive when measured against the effectiveness of a flame thrower of such limited capacity and unreliable performance.

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PERISCOPE TYPE FLAME THROWER IN ACTION, USING MIXED GASOLINE AND FUEL OIL. BULL DOZER BLADE REMOVED

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PERISCOPE FLAME THROWER
IN ACTION USING THICKENED
FUEL. DOZER BLADE REMOVED

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FORWARD END OF TANK ON FIRE.
CAUSED BY FUEL STREAM STRIKING
HYDRAULIC CYLINDER OF DOZER BLADE

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TEST #9 - OPERATIONAL CHARACTERISTICS OF THE EAV RADIO SCR-508 AND AN/VRC-3.

Purpose:

1. It is the purpose of this test to check the performance and adaptability of the radio sets to use in the EAV.

Method:

1. Both radio sets were used extensively during tests and in connection with the inter-communication system. A trained radio technician observed all tests and checked the operational features.

Results:

1. The SCR-508 is a frequency modulated radio transmitting and receiving set of medium power and is capable of handling communications with other armored vehicles within a range of approximately 7 to 8 miles under normal conditions.

2. The AN/VRC-3 is a frequency modulated radio transmitting and receiving set of low-power whose primary use is with the infantry within an effective radius of approximately one mile under all conditions.

3. The inter-communication system is connected through the interphone amplifiers located in the transmitter of the SCR-508. There are six interphone control positions located inside the vehicle and one outside the vehicle on the starboard side in the after-end. This last station is available for use by supporting infantry. A red signal light in the turret is used to indicate that the external interphone connection is in use.

4. There are two antenna systems provided, one located on either side of the turret. The location was chosen by the technicians installing the radio. No armored protection was indicated in the original installation but armored skirts were added to antenna supports to provide protection from collision with overhanging trees and other mechanical damage.

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5. In all functioning in the radio and inter-communicating phones, the results were good. During the period of the tests an excessively heavy and continuous downpour of rain with excessive humidity was the probable cause of partial failure and operating difficulties of the inter-communicating system. When the system was dried out the difficulty cleared up and thus protection against moisture is desired and indicated.

6. A further modification of the microphones of the inter-communicating system is desirable. It is suggested that the microphone switches be made of the non-locking type with the exception of that of the tank commander. The present microphone switches of all positions can be locked.

7. During these tests the headset HS-30 was worn by the tank crew and had been furnished with the tank. Complaints were voiced that the headset is extremely uncomfortable because of the ear plugs. This discomfort was sufficient to encourage the removal of the plugs to relieve the discomfiture, which obviously interferes with the operating efficiency of the inter-communicating system.

8. It is recommended that the HS MIS 11, which is now in Marine Corps standard, be used to replace the HS-30. It is lighter in weight, has less bulk, is worn with a greater degree of comfort under the tank crash helmet as it does not use ear inserts. The noise exclusion qualities, while not the best yet encountered in tests of various headsets by this Board, are satisfactory.

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TEST #10 - PLACEMENT OF M-3 DEMOLITION SNAKE.

Purpose:

1. The purpose of this test was to investigate methods of placement of the M-3 Demolition Snake using the EAV.

Method:

1. The accepted practice in placing the Demolition Snake is to engage the pushing hook of the Snake with the tow chains suspended from the towing shackles in the nose of the tank. For long distances the Snake can be towed to the approximate location by the vehicle and then pushed into the final position. The complete description of the Snake and its manipulation is contained in (TD ENG 60).

Results:

1. In the tests as conducted with the EAV as the motive power, the Snake responded well and can be pushed into position by the EAV, but the Dozer Blade causes some difficulty in aligning the vehicle on the Snake preparatory to the pushing operation. In rough terrain the Dozer Blade must be raised to prevent the inadvertent crushing of the Snake and driver's vision is thus greatly limited. The use of the M-3 Snake is deemed inadvisable except by the conventional tank which has not the handicap to vision now occasioned by the presence of the Dozer Blade.

2. When the pushing chains engage the launching hook of the Snake, the strain raises the after end of the Snake (See Figure #38) and it fouls the plates which form the support of the Dozer Blade operating cylinder. The damage done is shown in Figures #44 and #45.

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DAMAGE TO TAIL OF
SNAKE BY DOZER CYLINDER
MOUNTING BRACKETS
PORT SIDE OF SNAKE

MARINE CORPS BOARD
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FIG. 44

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DAMAGE TO SNAKE BY DOZER CYLINDER
MOUNTING BRACKETS STARBOARD SIDE

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SNAKE RAISED FROM GROUND
BY STRAIN ON PUSHING CHAINS
DAMAGE SHOWN IN FIG 44 CAUSED
BY BRACKETS INDICATED BY ARROW

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NOSE AND TOWING HOOK
OF M3 SNAKE

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SNAKE MOVING FORWARD
NOTE UNEVEN TERRAIN

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TEST #11 - EFFECTIVENESS OF "DOOZIT" ATTACHMENT, IN THE PLACEMENT AND FIRING OF CHARGES AGAINST OBSTACLES.

Purpose:

1. The purpose of this test was to determine the effectiveness of the "Doozit" in its intended usage.

Method:

1. Specifications and directives for the construction of a wooden frame "Doozit" were followed and a trial made by engaging the "Doozit" on the Dozer Blade with the prescribed load of demolitions, 1000 pounds.

Results:

1. The attempt met with failure as the wooden frame is not of sufficient strength to withstand the shock of travel over unstable terrain.

2. In view of the failure encountered from the first attempts, it was deemed advisable to consider other methods of placement. It was the contention of the observers and others concerned with this test that a more substantial metal frame "Doozit" be used and that demolition packs be replaced by a series of shaped charges. Due to change in test plans and lack of time to pursue this project, the material was set aside for further consideration.

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FAILURE OF WOODEN DOOZIT
UNDER A LOAD OF 1000 LBS

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The foregoing report of 82 pages on MCEB Project #447 submitted by:

A. G. LESLIE, JR.
1stLt, USMCR

Approved:

J. E. O'BRIEN
Major, USMCR
Chief, Experimental Section

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REPLYING
EFER TO NO.

10.77A-3-lw
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MARINE CORPS EQUIPMENT BOARD
MARINE BARRACKS, QUANTICO, VA.

14 June 1945

PROJECT #447

From: The President.
To: Chief, Experimental Section.

Subject: Engineer Armored Vehicle, test of.

Reference: (a) Sec ltr CMC Ser 004C8345 to Pres MCEB dtd 24Mar45.

1. In accordance with Reference (a), please conduct tests of the subject Armored Vehicle with particular regard being given to the facts desired in paragraph 2 of the reference and any other tests deemed necessary.

2. Priority "A" is assigned this project.

J. E. WEBER
By direction.

Copy to: CMC

COPY

APPENDIX "A"

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A0-563-jp
Ser 004C8345

SECRET

HEADQUARTERS U. S. MARINE CORPS
Washington

24 March 1945

From: Commandant of the Marine Corps.
To: President, Marine Corps Equipment Board.

Subject: Engineer Armored Vehicle, Request for tests of.

1. A pilot model Engineer armored vehicle is being manufactured by the Heintz Manufacturing Company, Philadelphia, Pennsylvania, for delivery to the Marine Corps Equipment Board, Quantico, Virginia, on or about 24 April 1945. This vehicle incorporates features of an M4A3 tank, equipped with wide tracks (T-80) and wide angle vision periscopes combined with additional features including an automatic single-tube, 7.2-inch rocket launcher, tank dozer blade, 50-gallon Sponson-type tank flame thrower, and additional belly armor for protection against anti-personnel mines. A "Doozit" attachment and 150 7.2-inch high explosive demolition rockets will be shipped to the Marine Corps Equipment Board, delivery to coincide with that of the tank.

2. Upon receipt of the Engineer armored vehicle, the Marine Corps Equipment Board is requested to conduct tests to determine:

(a) Accuracy, efficiency, durability, and rate of fire of the modified T-76 rocket launcher.

(b) Efficiency and ease of operation of the tank dozer blade when used on the Engineer armored vehicle.

(c) Adequacy of periscopes for efficient operation of the Engineer armored vehicle.

(d) Range and efficiency of the 50-gallon on Sponson-type tank flame thrower as adapted to the Engineer armored vehicle.

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Subject: Engineer Armored Vehicle, Request for tests of.

(e) Inner compartment storage capacity for rockets and explosives.

(f) Efficiency of the "Doozit" attachment in placement and firing of charges against obstacles.

(g) Efficiency and speed with which Engineer demolition crews can enter and leave this vehicle through the side port.

3. Priority "A" is assigned this project.

4. By copy of this letter, the Commandant of the Marine Corps Schools, Quantico, Virginia, is requested to make available to the Marine Corps Equipment Board, the services of the Engineer Demonstration Platoon as required for construction of reinforced concrete emplacements, block houses, or obstacles to be used in these tests.

5. Transmission by Registered Guard Mail or U. S. Registered Mail is authorized in accordance with Article 76(15) (e) and (f), U. S. Navy Regulations.

G. C. THOMAS,
By direction.

Copy to: Comdt., MarCorps Schools.

COPY